

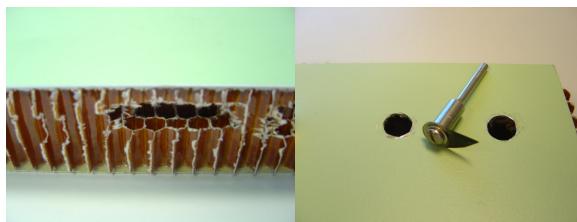
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14. ABSTRACT Letterkenny Army Depot (LEAD) in Chambersburg, Pa. repairs or replaces wall panels on Humvee mounted Chem/Bio units. The material used on these panels consists of two very thin aluminum sheets. Between the aluminum sheets is paper honeycomb bonded together with epoxy resin. This thin sandwich structure does not provide the support required for mounting brackets or other attachments. The process was to drill 0.25 to 0.36-inch diameter holes, remove an additional 0.5-inch radius of paper honeycomb material by hand from around the hole, and fill the resulting cavity with resin and a threaded fastener. Approximately 200 holes are drilled per unit. The problem occurred when attempting to remove the paper particles after the initial hole had been drilled. This was a very cumbersome and timeconsuming operation. LEAD asked if the National Center for Defense Manufacturing and Machining (NCDMM) could provide or recommend a solution to reduce the time required to remove of the paper honeycomb particles.				
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PROBLEM / OBJECTIVE

Letterkenny Army Depot (LEAD) in Chambersburg, Pa. repairs or replaces wall panels on Humvee-mounted Chem/Bio units. The material used on these panels consists of two very thin aluminum sheets. Between the aluminum sheets is paper honeycomb bonded together with epoxy resin.

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Tooling and sample test cuts made with tooling at 25,000 rpm

ACCOMPLISHMENTS / PAYOFF

Process Improvement

NCDMM experimented with various tooling similar to that which LEAD was using. To eliminate the use of

tweezers to remove the paper particles from the hole, a process was developed to turn the paper remains into very small particles or dust that could be vacuumed from the cavity. A hand held high-speed (25,000 revolutions per minute [rpm]) spindle type tool and a special cutter were tested. These proved to form a viable solution. The paper was cut into dust and was vacuumed out with little effort. This eliminated the hand removal of additional paper prior to resin application.

Implementation and Technology Transfer

The following process and tool recommendations were made to LEAD:

- Utilize the hand-held high-speed spindle style tool providing 10,000 - 25,000 rpm
- Use a plunging adapter for stability in the drilled cavity.
- Install a vacuum attachment on the router to eliminate tool change
- Use a stainless steel utility blade as the cutter

Expected Benefits

The operator can now drill and clear the cavity in approximately 50% less time per hole (reduced from 10 minutes per hole to 5 minutes). With the vacuum attachment, paper particles can now be vacuumed from the cavity while the cutter is cutting the material. This eliminates handwork.

LEAD is expected to process 80 of these Chem/Bio units annually. At 1,000 minutes saved per unit, labor savings of \$500,000 are projected over a five-year period.

TIME LINE / MILESTONE

Start Date October 03
Recommendations Made December 03

PROJECT FUNDING

NCDMM funding \$2K

PARTICIPANTS

NCDMM
Letterkenny Army Depot